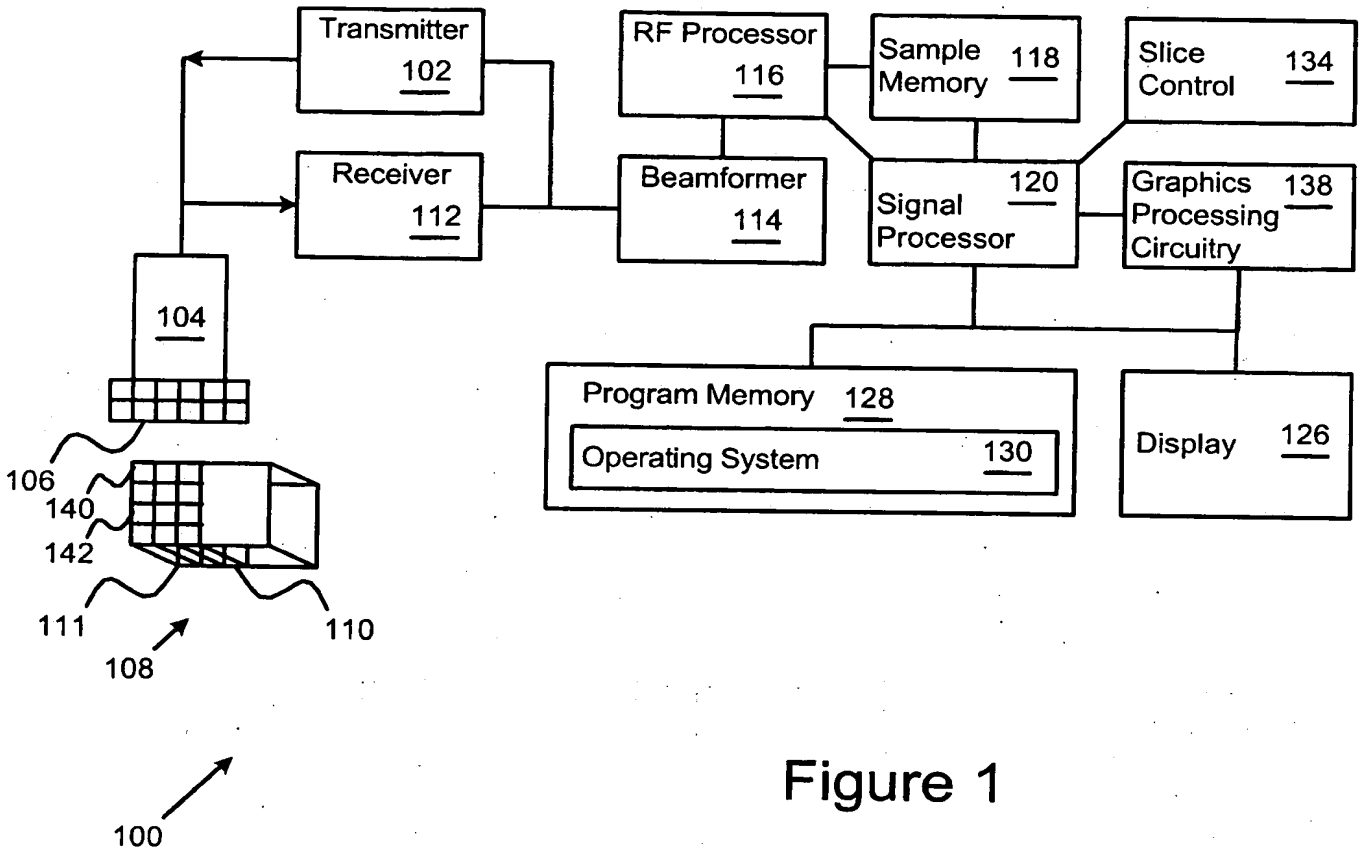
Transmitter
102
RF Processor
116
Sample
Memory
118
Slice
Control
134
Receiver
112
Beamformer
114
Signal
Processor
120
Graphics
Processing
Circuitry
138
104
Program Memory
128
Operating System
130
Display
126
106
140
142
111
110
108
100

Figure 1

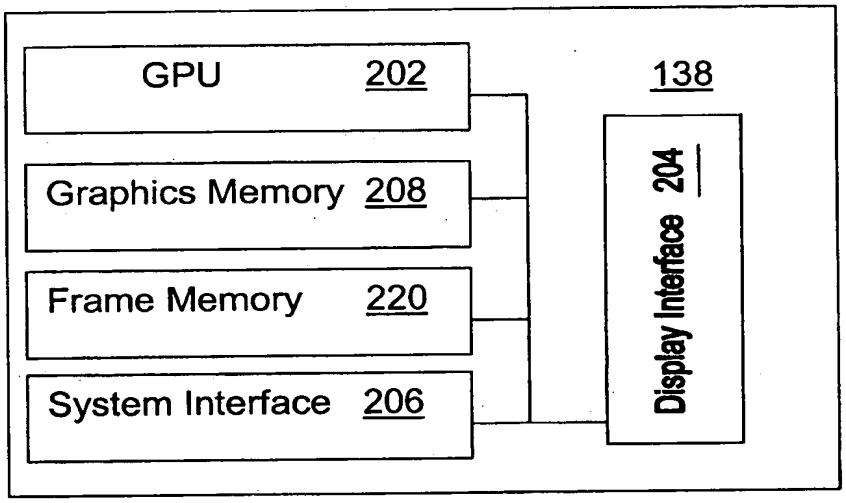
GPU 202
Graphics Memory 208
Frame Memory 220
System Interface 206
138
Display Interface 204

Figure 2

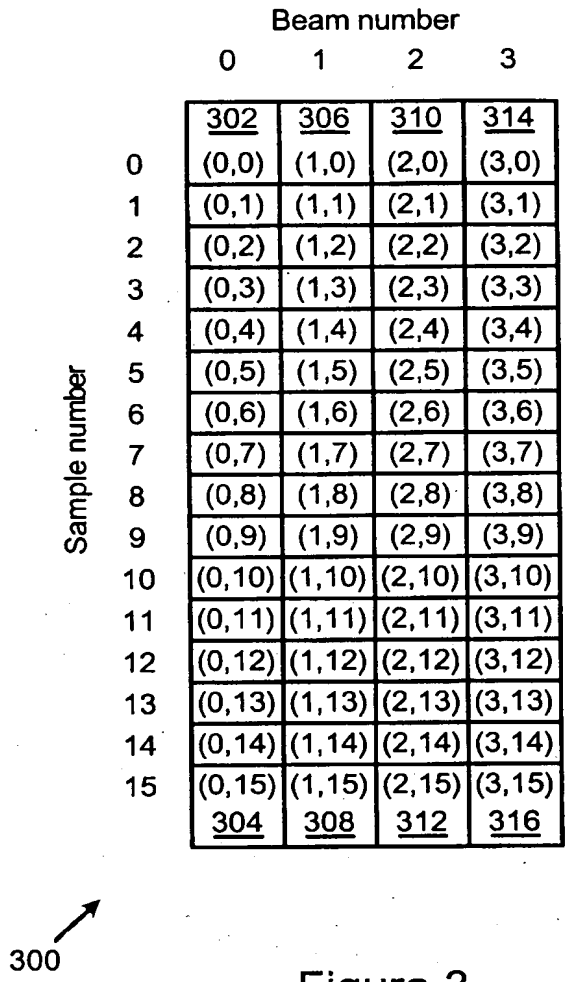
Beam number
0
1
2
3
302
306
310
314
Sample number
0 (0,0) (1,0) (2,0) (3,0)
1 (0,1) (1,1) (2,1) (3,1)
2 (0,2) (1,2) (2,2) (3,2)
3 (0,3) (1,3) (2,3) (3,3)
4 (0,4) (1,4) (2,4) (3,4)
5 (0,5) (1,5) (2,5) (3,5)
6 (0,6) (1,6) (2,6) (3,6)
7 (0,7) (1,7) (2,7) (3,7)
8 (0,8) (1,8) (2,8) (3,8)
9 (0,9) (1,9) (2,9) (3,9)
10 (0,10) (1,10) (2,10) (3,10)
11 (0,11) (1,11) (2,11) (3,11)
12 (0,12) (1,12) (2,12) (3,12)
13 (0,13) (1,13) (2,13) (3,13)
14 (0,14) (1,14) (2,14) (3,14)
15 (0,15) (1,15) (2,15) (3,15)
304
308
312
316
300

Figure 3

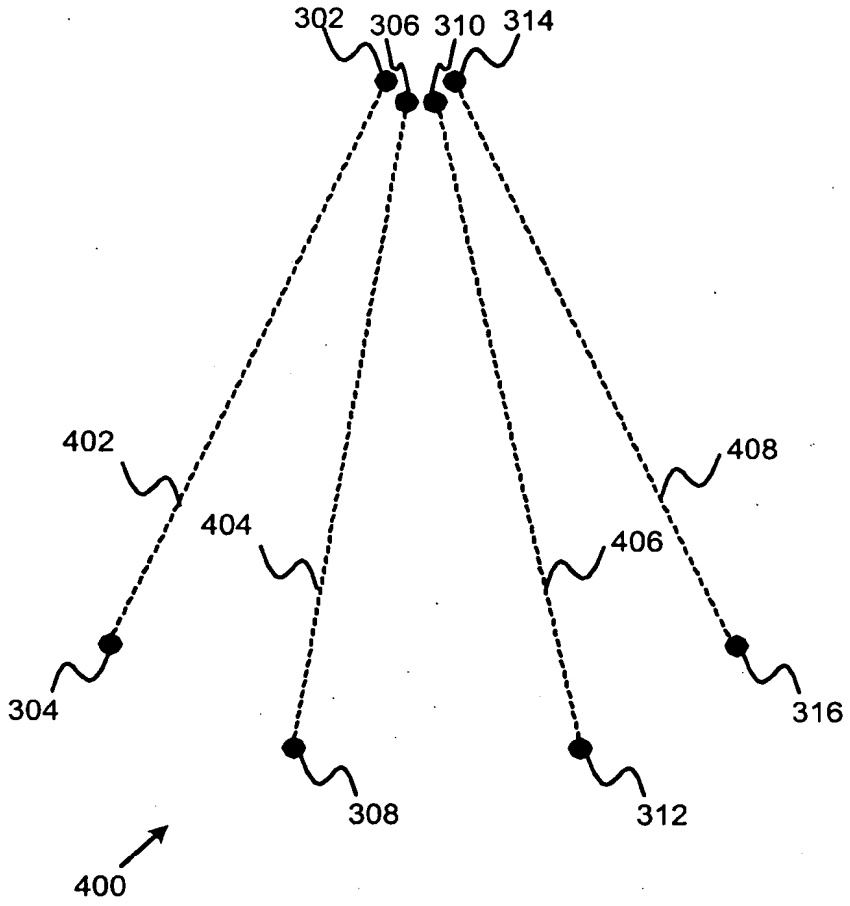

Figure 4

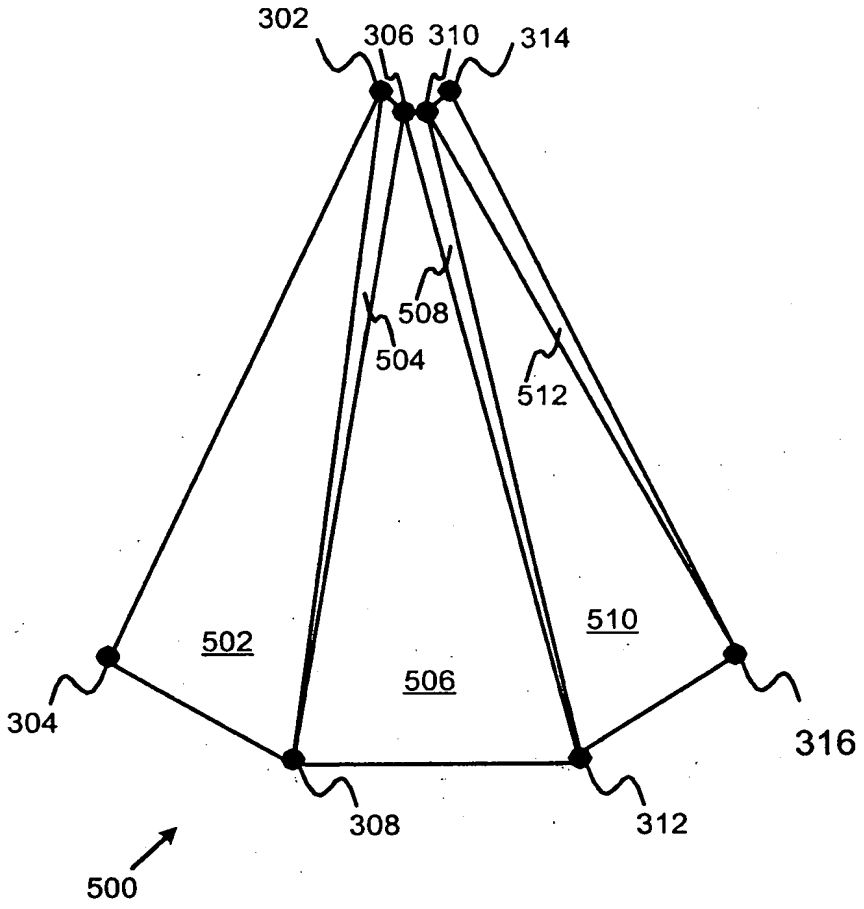

Figure 5

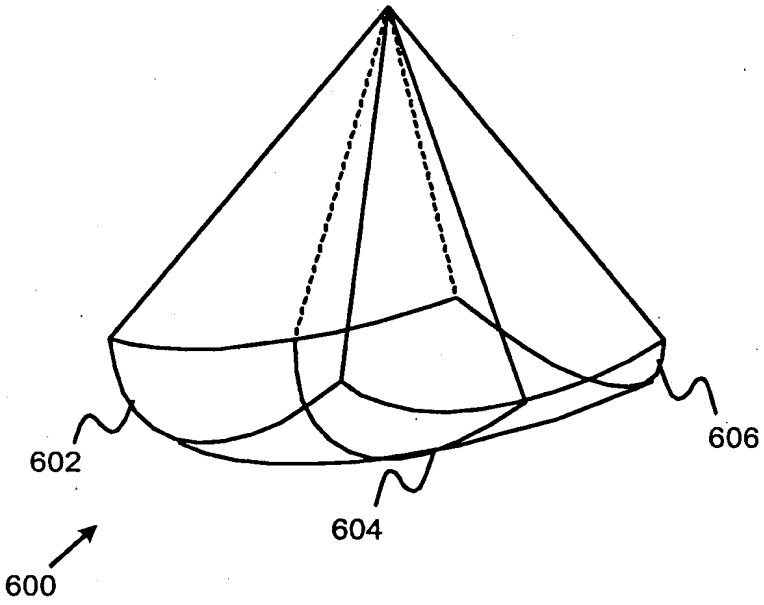

Figure 6

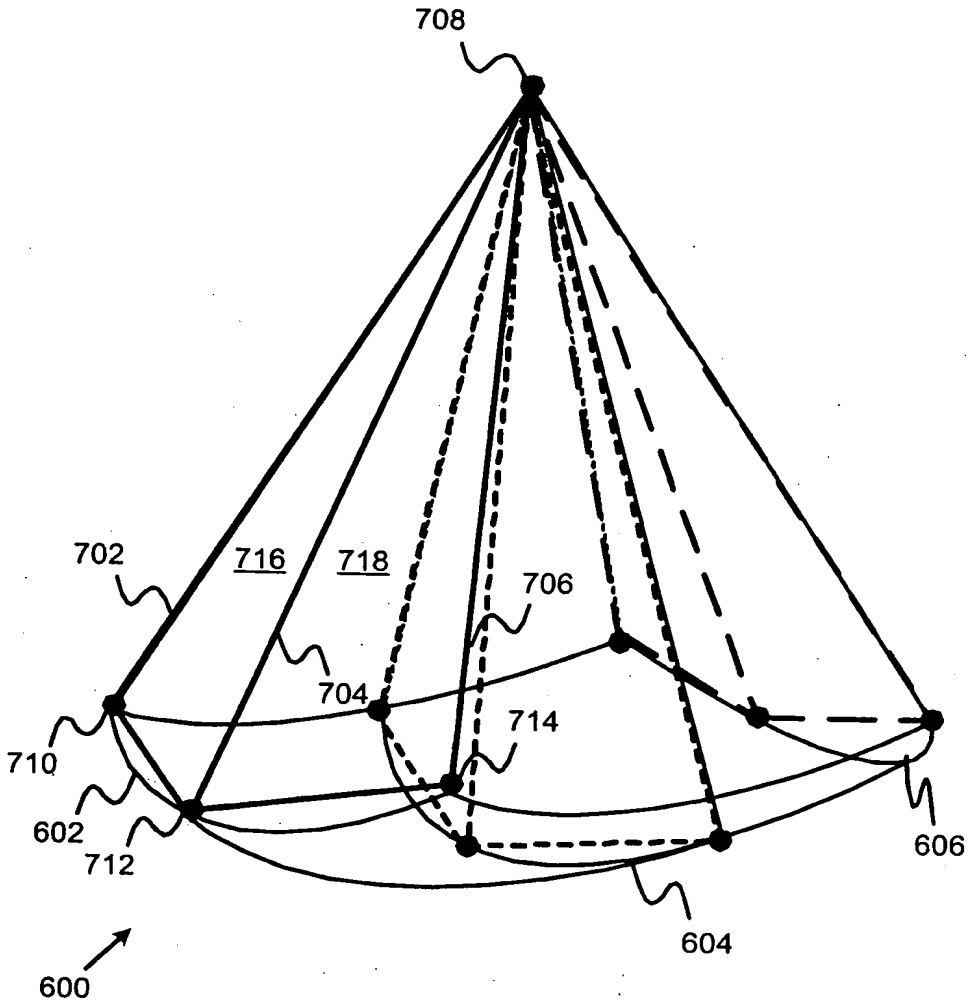

Figure 7

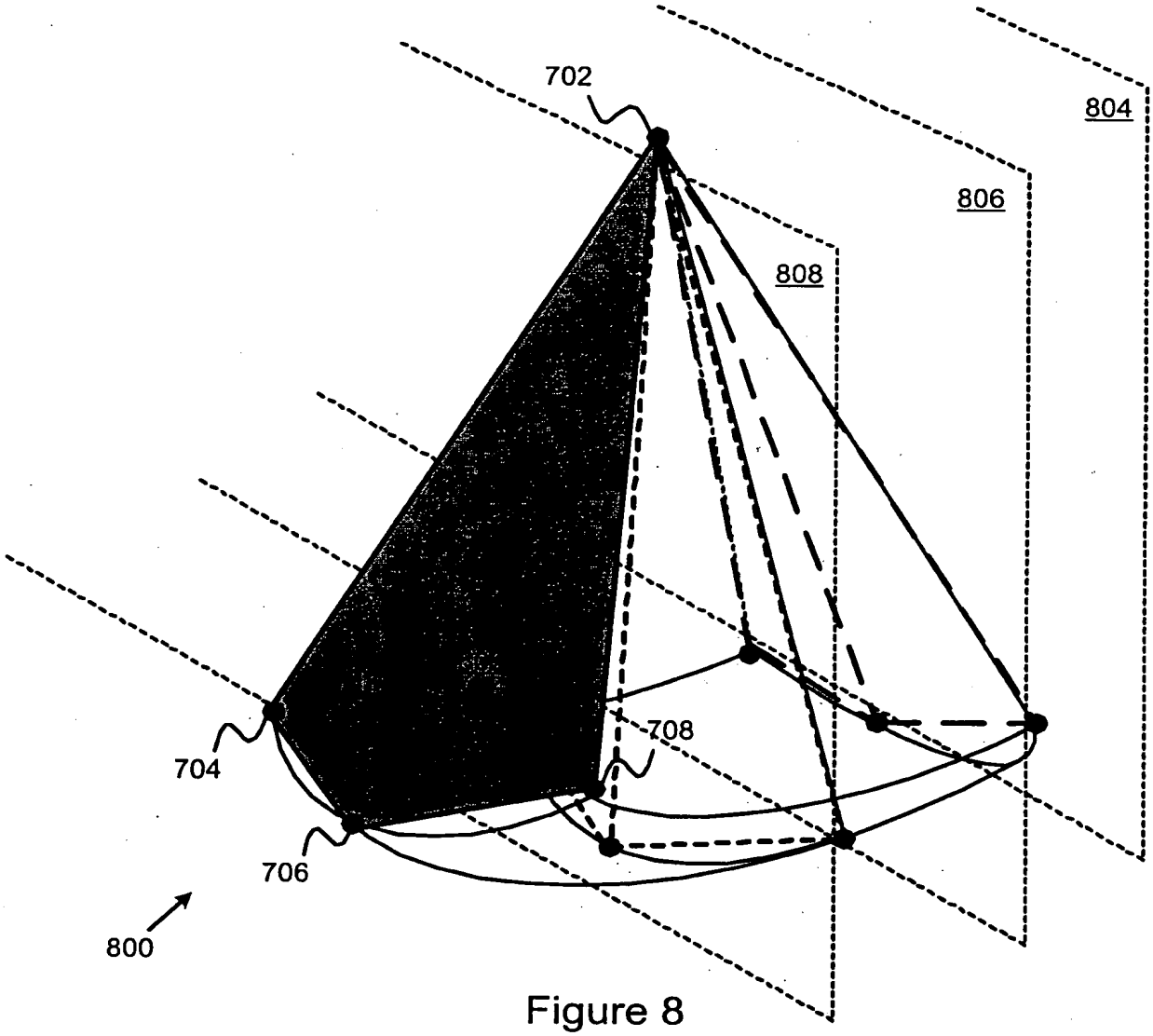

Figure 8

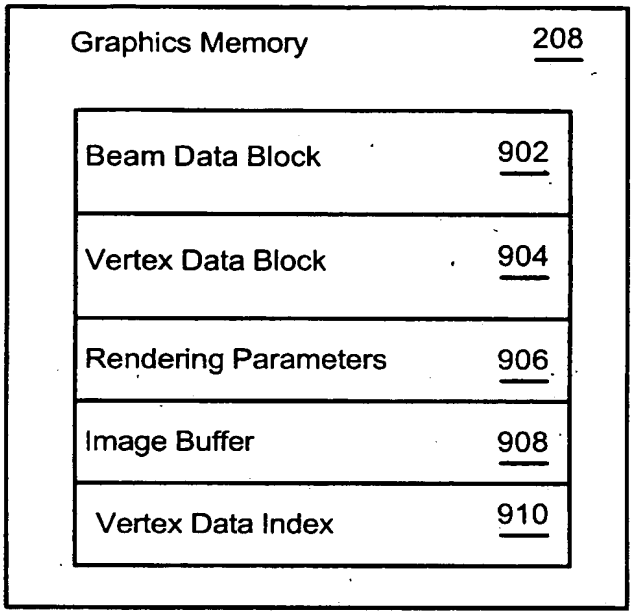
Graphics Memory
208
Beam Data Block
902
Vertex Data Block
904
Rendering Parameters
906
Image Buffer
908
Vertex Data Index
910

Figure 9

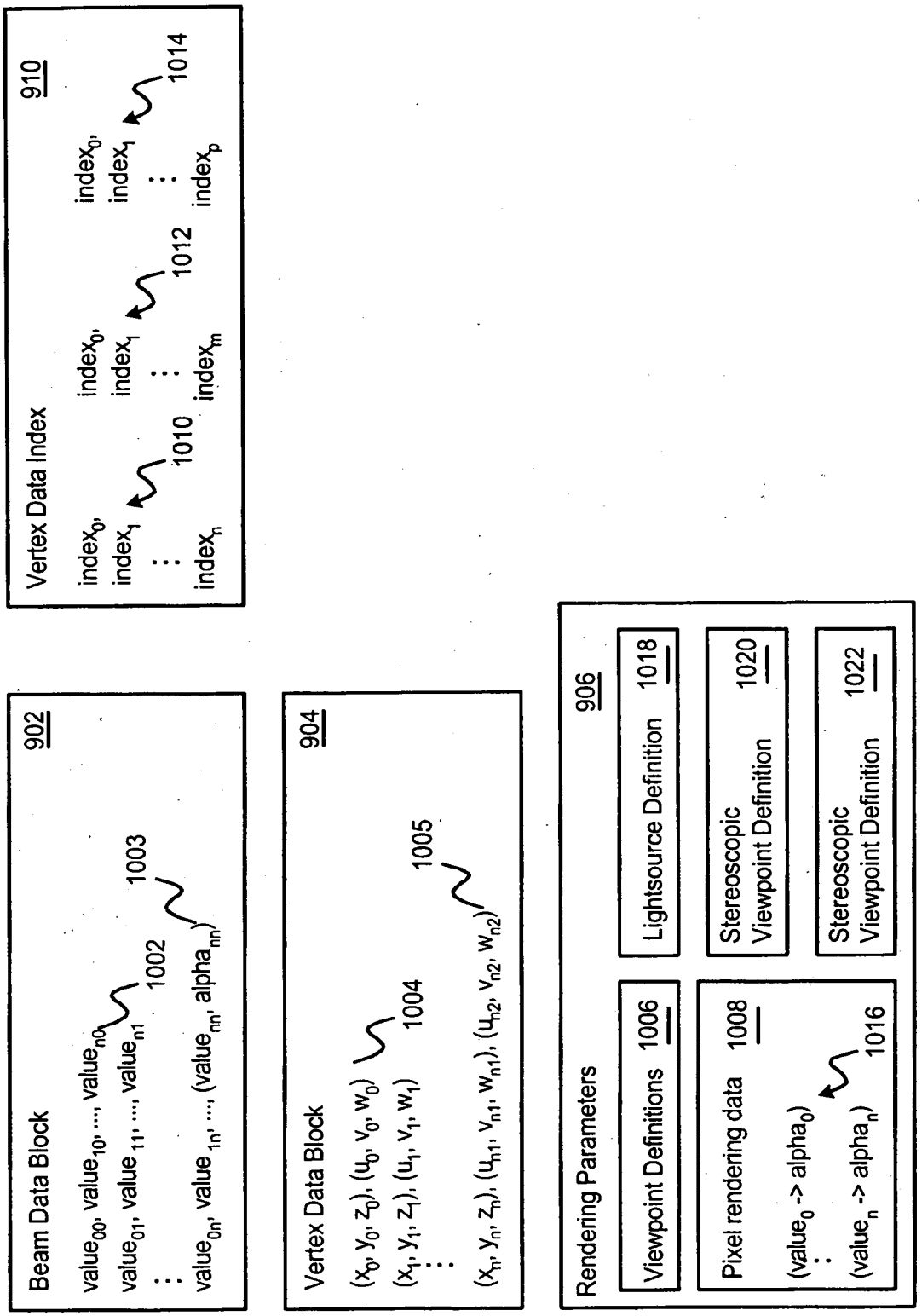
Beam Data Block
902
value00, value10, ..., valuen0
value01, value11, ..., valuen1
1002
1003
value0n, value1n, ..., (valuenn, alphann)
Vertex Data Index
910
index0, index1, ..., indexm
1010
index0, index1, ..., indexp
1012
1014
Vertex Data Block
904
(x0, y0, z0), (u0, v0, w0)
(x1, y1, z1), (u1, v1, w1)
1004
1005
(xn, yn, zn), (un1, vn1, wn1), (un2, vn2, wn2)
Rendering Parameters
906
Viewpoint Definitions 1006
Lightsource Definition 1018
Pixel rendering data 1008
(value0 -> alpha0)
(valuen -> alphan)
1016
Stereoscopic Viewpoint Definition 1020
Stereoscopic Viewpoint Definition 1022
1000

Figure 10

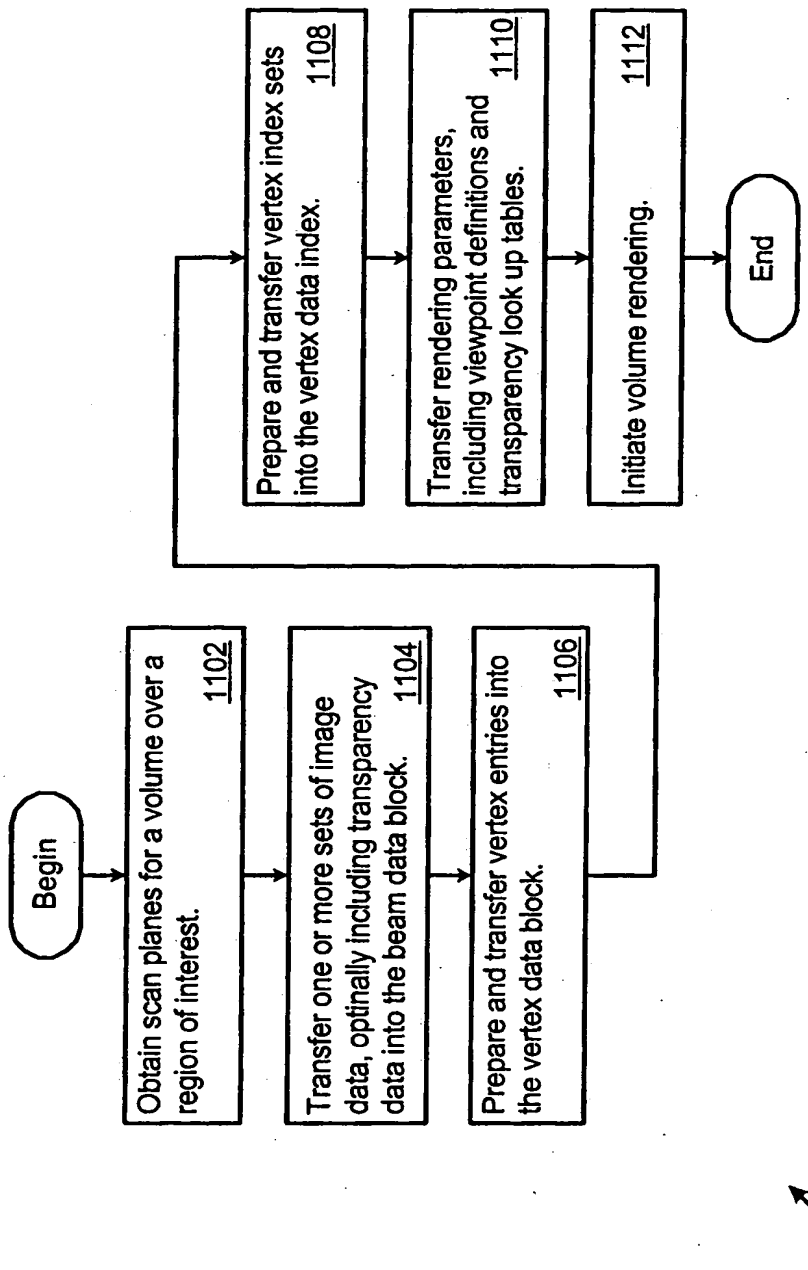
Begin
Obtain scan planes for a volume over a region of interest. 1102
Transfer one or more sets of image data, optinally including transparency data into the beam data block. 1104
Prepare and transfer vertex entries into the vertex data block. 1106
Prepare and transfer vertex index sets into the vertex data index. 1108
Transfer rendering parameters, including viewpoint definitions and transparency look up tables. 1110
Initiate volume rendering. 1112
End
1100

Figure 11